PROPERTY PLANNING COMMON ELEMENTS

COMPONENTS OF MASTER PLANS

HABITATS AND THEIR MANAGEMENT

Black Spruce

Description

This page describes management of black spruce swamp, a lowland acidic conifer forest community comprised of >50% swamp conifers, with black spruce predominating. It often occurs in complexes with other acid peatland communities (e.g., muskeg, open bog, tamarack swamp). Black spruce swamp is characterized by a relatively dense (>50% cover) canopy of black spruce with tamarack or, less commonly, jack pine as associates. Other tree species such as red maple, white birch, and white pine may occur sporadically as seedlings or saplings depending on the availability of seed sources from surrounding forests. These species seldom persist for long unless the stand is disturbed such that drainage conditions improve. The black spruce swamp flora is relatively species-poor, composed of species adapted to "bog" conditions – a continuous carpet of peat-forming *Sphagnum* mosses, high acidity, cold temperatures and slowly-thawing soils, a short growing season, and low nutrient and oxygen availability. Labrador tea is common in the understory along with dwarf shrubs such as creeping-snowberry and small cranberry. Herbaceous species include tussock cotton-grass, three-seeded sedge, boreal bog sedge, few-seeded sedge, three-leaved false Solomon's-seal, and swamp false Solomon's-seal. Black spruce swamp provides critical breeding habitat for boreal species that reach the southern edges of their distributions in northern Wisconsin. These include birds like boreal chickadee, gray jay, spruce grouse, and yellow-bellied flycatcher and boreal butterflies and dragonflies. Black spruce swamps that adjoin stands of upland conifers such as hemlock, balsam fir, or pines appear to be especially important to area-sensitive conifer-dependent species.

Black spruce swamp is widely distributed through the glaciated portions of northern Wisconsin and is locally common in parts of the Central Sand Plains Ecological Landscape. A few small, disjunct stands occur in the glaciated parts of southern Wisconsin (Columbia, Ozaukee, and Washington counties).

Ecological Landscape Opportunities

Ecological Landscape	Opportunity*
Forest Transition	M
North Central Forest	M
Northern Highland	M
Central Sand Hills	I
Central Sand Plains	I
Northeast Sands	I
Northwest Lowlands	I
Northwest Sands	I
Superior Coastal Plain	I
Central Lake Michigan Coastal	P
Northern Lake Michigan Coastal	P
Southeast Glacial Plains	P

M = Major; major opportunity exists in this Landscape; many significant occurrences are recorded, or restorations likely to be successful.
I = Important; several occurrences important to maintaining the community in the state occur in this Landscape.
P = Present; community is present in the Landscape but better opportunity exists elsewhere.

Rare Species

Many Species of Greatest Conservation Need (SGCN) are associated with black spruce swamp based on the findings in Wisconsin's 2015 Wildlife Action Plan. To learn more, visit the Northern Forest communities page and click on "Black Spruce Swamp".

Threats

- Altered hydrology is a primary threat to black spruce. Flooding due to beaver activity, dam or dike construction, or poorly designed and constructed rights-of-way (roads, railroads, powerlines, pipelines) that cross forested peatlands may drown or otherwise alter extensive areas of conifer swamp. Waters carrying excess sediments or nutrients can change plant community composition and structure when introduced into an acid peatland system. Drained sites may be invaded by exotic invasive plants.
- Motorized vehicles can create ruts which alter hydrology, facilitate entry of sediments and pollutants, and serve as entry points for invasive plants.
- Fire is a threat to black spruce during periods of drought.
- Black spruce is affected by insect pests such as spruce budworm that can defoliate significant areas and by parasites such as eastern dwarf mistletoe.
- Black spruce is projected to undergo significant decreases in habitat suitability due to climate change. It is at the southern edge of its range in Wisconsin, requires a cold climate, and is vulnerable to drought and insect pests.

Management Techniques

- Clearcut (progressive strip)
- Overstory removal
- Shelterwood
- Group selection
- Patch selection
- Passive management
- Seed tree
- Single-tree selection
- Site preparation
- Intermediate treatments

- Pesticide treatments

Management Considerations

- Wherever possible, manage black spruce as part of a complex of related and interconnected forest and wetland habitats.
- Protect and maintain large and/or high-quality examples of black spruce swamp, particularly when adjacent to other intact habitats. Where possible, manage for larger stands, larger blocks, to increase connectivity with surrounding native habitats, and to soften sharp transitions between habitat types.
- Carefully consider both landscape (watershed; surrounding land uses and vegetation; patch size, etc.) and site (hydrology; species composition; soils and topography; stand age, etc.) features and develop a management approach based on this assessment. Use an adaptive management approach, and monitor results.
- Passive management may be employed for black spruce, particularly where trees are small, slow-growing, non-merchantable, or where site conditions preclude active management without damage to hydrology, soils, or wildlife habitat.
- If employing active management, consider effects on surrounding forests when applying silvicultural techniques. For example, strip cutting can create high-contrast edge and minimize or eliminate larger patches of forest-interior habitat.
- Maintain or restore site hydrology whenever feasible.
- Use management practices that limit soil damage, erosion, sedimentation, and hydrologic changes to the stand and to adjacent areas.
- Conduct timber harvests only under frozen-ground or very dry conditions to prevent rutting and soil damage and to protect site hydrology.